

## **REMARKS**

This is a full and timely response to the outstanding Final Office Action mailed March 14, 2003. Reconsideration and allowance of the application and presently pending claims are respectfully requested.

### **Present Status of Patent Application**

Upon entry of the amendments in this response, claims 2-8, 10-16, 19-23, 25-32, and 34-41 remain pending in the present application. More specifically, claims 1, 9, 17-18, 24 and 33 are cancelled without prejudice, waiver, or disclaimer; while claims 2, 10, 25, and 34 that are formerly dependent claims have been re-presented as independent claims incorporating all the limitations of the former dependent claims with no addition of new matter. Furthermore, currently-amended claims 4, 6, 12, 14, 20, 23, 27, 29, 32, 36 and 38 incorporate all the limitations of the corresponding former dependent claims, with no addition of new matter.

#### **A. Response to Claim Objections**

The Office Action indicates that claim 20 is objected to because of an informality, wherein claim 20 was recited as being dependent upon itself. This objection has been addressed in currently amended claim 20, which is recited as being dependent on claim 19.

#### **B. Claim Rejections - 35 U.S.C. § 102**

##### **1. Rejections under 35 U.S.C. § 102(b)**

##### **a) Statement of the Rejection**

Claims 1-16 and 19-41 have been rejected under 35 U.S.C. 102(b) as being anticipated by Lear, U.S. Patent 5,633,527.

**b) Response to the Rejection**

Claims 1, 9, 24, and 33 were rejected under 35 U.S.C. 102(b) as being anticipated by Lear, U.S. Patent 5,633,527. Since claims 1, 9, 24, and 33 have been cancelled without waiver, disclaimer or prejudice, this rejection is rendered moot.

Claims 2, 10, 25, and 34 were rejected as Lear allegedly discloses the first non-concave reflector including an outer layer of material that has a thickness that varies as a function of radial distance out from an axial center of the outer layer, as described in Lear column 20, lines 24-67 and column 21, lines 1-14. Applicant respectfully traverses this rejection for at least the following reasons:

i) The Office Action states that Lear discloses an “outer layer of material (44)” (Emphasis Added) whereas multiple references in Lear column 20, lines 24-67 describe a “lens-forming region 44.” (Emphasis Added). Applicant respectfully asserts that the structure of a lens-forming *region* is quite distinct from that of Applicant’s “*an outer layer of material*” (Emphasis Added) as stated in Applicant’s re-presented (as well as the earlier “once amended”) claims 2, 10, 25, and 34.

Lear’s lens-forming region as described by unitary lens 14 in Lear column 10, lines 43-50, is implemented as a “trench” or a “well” that is formed by an appropriate shaping of the access regions 32 (Lear column 8, lines 32-35). Applicant submits that Lear’s lens is formed by an absence of material unlike Applicant’s first non-concave reflector that includes an outer layer of material formed of a *thickness*. Applicant respectfully asserts that Lear fails to at least teach such an outer layer of material, and that rejection of claims 2, 10, 25, and 34 should be withdrawn.

ii) The Office Action states that Lear discloses an “outer layer of material (44) that has a thickness that varies as a function of radial distance out from an axial center of the outer layer.” (Emphasis Added). Applicant respectfully submits that such layer with such a thickness

characteristic is not disclosed in Lear Column 20, lines 24-67 and column 21, lines 1-14, nor in the rest of the disclosure. Applicant specifically describes “an *outer layer* of material” (514) “that has a thickness that varies as a function of radial distance out from an axial center of the *outer layer*.” (Emphasis Added). Lear does not disclose such an outer layer, much less one of “varying thickness,” and Applicant respectfully asserts that rejection of claims 2, 10, 25, and 34 should be withdrawn.

Claims 3, 11, 26, and 35 were rejected as Lear allegedly discloses an outer layer that includes “a substantially convex, semispherical outer surface (14) and a substantially planar inner surface as shown in Figure 8 and as described in column 10, lines 43-50.”

Lear’s unitary lens 14 as described in column 8, lines 32-35, states that “one or more unitary lenses 14 of any shape may be formed by an appropriate shaping of the access regions 32, including both positive and negative unitary lenses 14 on the same substrate 12.” (Emphasis Added). Unitary lens 14 is further described in Lear column 10, lines 43-50 as a “negative lens” in the form of a “trench” or a “well.”

Such a unitary lens, be it positive or negative, does not incorporate either an inner or an outer surface that is comparable to an inner and/or outer surface of Applicant’s outer layer of material (514). Applicant respectfully asserts that Lear fails to teach all of the claimed elements, and that rejection of claims 3, 11, 26, and 35 should be withdrawn.

Claims 4, 12, 27, and 36 were rejected as Lear allegedly discloses that “the first non-concave reflector includes an outer layer of material (28) that has an index of refraction that varies as a function of radial distance out from an axial center of the outer layer as described in column 20, lines 24-67 and column 21, lines 1-14.” Contrary to the allegation, referring to Lear column 7, lines 3-7, Lear states “lower-refractive-index portion 28 may have a refractive index,  $n$ , of about 1.6 as compared to  $n \approx 2.9$  or higher for an as-grown AlGaAs semiconductor layer 16.” While this statement indicates two different refractive indices, it will be understood that

these two refractive indexes comprising fixed, uniform refractive index values that are applicable to two different elements (layers) with no defined variation of refractive index within each of these two distinct layers. Lear's disclosure related to refractive index is significantly different from Applicant's "outer layer of material" that has "an index of refraction that varies as a function of radial distance out from an axial center of the outer layer." (Emphasis Added). Applicant respectfully asserts that Lear fails to teach all of the claimed elements, and that rejection of claims 4, 12, 27, and 36 should be withdrawn.

Rejected claims 5, 13, 28, and 37 are currently amended to be dependent on currently amended claims 4, 12, 27, and 36. Consequently, Applicant requests that rejection of claims 5, 13, 28, and 37 should be withdrawn.

Rejected claims 6, 14, 29, and 38 are currently amended to be dependent on re-presented claims 2, 10, 25, and 34. Consequently, Applicant requests that rejection of claims 6, 14, 29, and 38 should be withdrawn.

Rejected claims 7, 15, 30, and 39 are previously amended to be dependent on currently amended claims 6, 14, 29, and 38. Consequently, Applicant requests that rejection of claims 7, 15, 30, and 39 should be withdrawn.

Rejected claims 8, 16, 31, and 40 are previously amended to be dependent on currently amended claims 6, 14, 29, and 38. Consequently, Applicant requests that rejection of claims 8, 16, 31, and 40 should be withdrawn.

Rejected claim 23 is currently amended to be dependent on re-presented claim 2. Consequently, Applicant requests that rejection of claim 23 should be withdrawn.

Rejected claim 32 is currently amended to be dependent on re-presented claim 25. Consequently, Applicant requests that rejection of claim 32 should be withdrawn.

Claim 19 was rejected as Lear allegedly discloses "a vertical cavity surface emitting laser" comprising a layer of material (14, 28) that "has an index of refraction that varies as a

function of radial distance out from the center of the layer.” Contrary to the allegation, referring to Lear column 7, lines 3-7, Lear refers to “lower-refractive-index portion 28 may have a refractive index,  $n$ , of about 1.6 as compared to  $n \approx 2.9$  or higher for an as-grown AlGaAs semiconductor layer 16.” While this statement indicates two different refractive indices, it will be understood that these two refractive indexes comprising fixed, uniform refractive index values that are applicable to two different elements (layers) with no defined variation of refractive index within each of these two distinct layers. Lear’s disclosure related to refractive index is significantly different from Applicant’s “outer layer of material” that has “an index of refraction that varies as a function of radial distance out from an axial center of the outer layer.” Applicant respectfully asserts that Lear fails to teach all of the claimed elements, and that rejection of claim 19 should be withdrawn.

Rejected claim 20 is currently amended to be dependent on previously amended claim 19. Consequently, Applicant requests that rejection of claim 19 should be withdrawn.

Claim 21 was rejected as Lear allegedly discloses a method of manipulating light in a vertical cavity surface emitting laser, comprising “a layer of material (14, 28) having a thickness that varies as a function of radial distance...” Applicant respectfully submits that Lear does not describe “a layer of material (14, 28) having a thickness that varies” especially “as a function of radial distance.” (Emphasis Added). Applicant respectfully asserts that Lear fails to teach all of the claimed elements, and that rejection of claim 21 should be withdrawn.

Claim 22 was rejected as Lear allegedly discloses a method for manipulating light in a vertical cavity surface emitting laser comprising “a layer of material (14, 28) having an index of refraction that varies as a function of radial distance out from the center of the layer.” Contrary to the allegation, referring to Lear column 7, lines 3-7, Lear refers to “lower-refractive-index portion 28 may have a refractive index,  $n$ , of about 1.6 as compared to  $n \approx 2.9$  or higher for an as-grown AlGaAs semiconductor layer 16.” While this statement indicates two different

refractive indices, it will be understood that these two refractive indexes comprising fixed, uniform refractive index values that are applicable to two different elements (layers) with no defined variation of refractive index within each of these two distinct layers. Lear's disclosure related to refractive index is significantly different from Applicant's "outer layer of material" that has "an index of refraction that varies as a function of radial distance out from an axial center of the outer layer." (Emphasis Added). Applicant respectfully asserts that Lear fails to teach all of the claimed elements, and that rejection of claim 22 should be withdrawn.

Claim 41 was rejected as Lear allegedly discloses a method of manipulating light in a vertical semiconductor optical filter, comprising "a layer of material (14, 28) having a thickness that varies as a function of radial distance..." Applicant respectfully submits that Lear does not describe "a layer of material (14, 28) having a thickness that varies" especially "as a function of radial distance." (Emphasis Added), and that rejection of claim 41 should be withdrawn.

**2. Rejections under 35 U.S.C. § 102(e)**

**a) Statement of the Rejection**

Claims 1, 6-9, 14-16, 23, 24, 29-33, and 38-40 have been rejected under 35 U.S.C. 102(e) as being anticipated by Tayebati et al. Patent 6,438,149.

**b) Response to the Rejection**

Claims 1, 9, 24, and 33 were rejected under 35 U.S.C. 102(e) as being anticipated by Tayebati et al. Since claims 1, 9, 24, and 33 have been cancelled, this rejection is rendered moot.

Rejected claims 6, 14, 29, and 38 are currently amended to be dependent on re-presented claims 2, 10, 25, and 34. Consequently, Applicant requests that rejection of claims 6, 14, 29, and 38 should be withdrawn.

Rejected claims 7, 15, 30, and 39 are previously amended to be dependent on currently amended claims 6, 14, 29, and 38. Consequently, Applicant requests that rejection of claims 7, 15, 30, and 39 should be withdrawn.

Rejected claims 8, 16, 31, and 40 are previously amended to be dependent on currently amended claims 6, 14, 29, and 38. Consequently, Applicant requests that rejection of claims 8, 16, 31, and 40 should be withdrawn.

Rejected claim 23 is currently amended to be dependent on re-presented claim 2. Consequently, Applicant requests that rejection of claim 23 should be withdrawn.

Rejected claim 32 is currently amended to be dependent on re-presented claim 25. Consequently, Applicant requests that rejection of claim 32 should be withdrawn.

**Prior Art Made of Record**

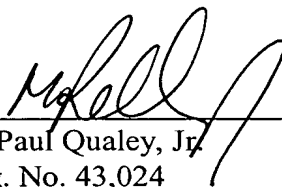
The prior art made of record has been considered, but is not believed to affect the patentability of the presently pending claims.



### CONCLUSION

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that claims 2-8, 10-16, 19-23, 25-32, and 34-41 are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,



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